



(11) Publication number: **0 465 099 A1**

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number: **91305752.7**

(51) Int. Cl.<sup>5</sup>: **H02G 5/04**

(22) Date of filing: **25.06.91**

(30) Priority: **29.06.90 FI 903310**

(43) Date of publication of application:  
**08.01.92 Bulletin 92/02**

(84) Designated Contracting States:  
**AT BE CH DE DK ES FR GB GR IT LI LU NL SE**

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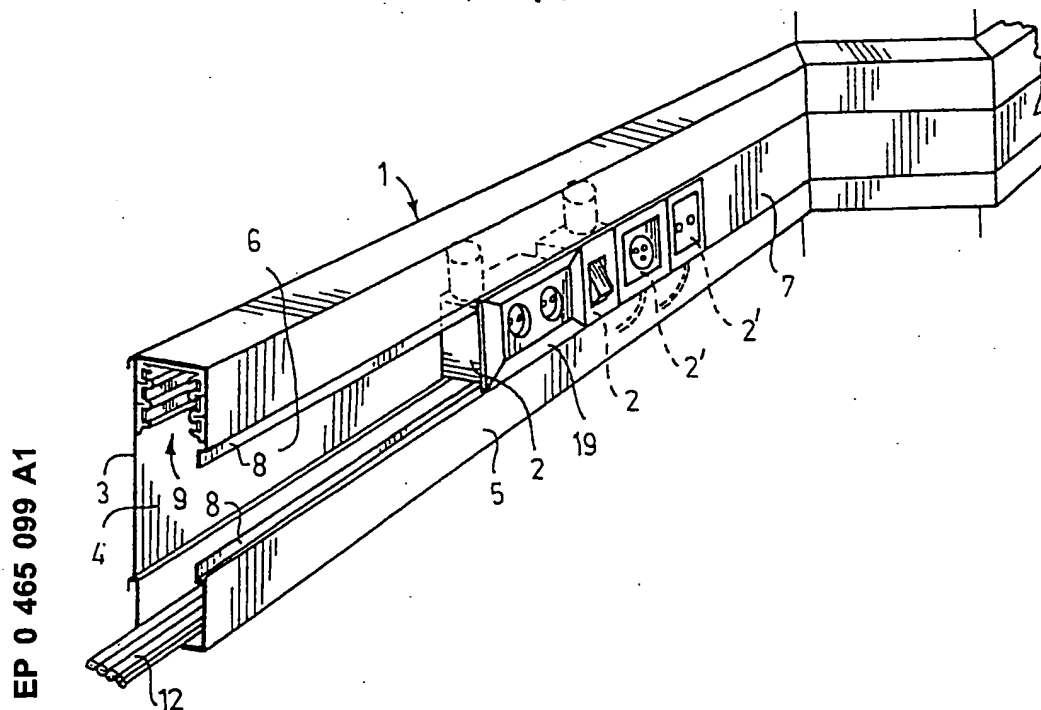
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(54) **A cable duct for cables and conductors and outlet boxes to be connected thereto.**

(57) Cable duct for cables and cords and outlet boxes to be connected to them. The cable duct (1) comprises a case-like channel track (3) forming a cable space (4) for cables and cords (12) and an installation slot (6) for outlet boxes (2, 2'), and a cover plate (7) covering the installation slot. In order to simplify the connection of outlet boxes to the cables, a conductor rail (9) including fixed longitudinal bare current conductors (11) is provided in the cable space (4) of the channel track (3) for electrically connecting the outlet boxes (2) to a power current network.

**FIG. 1**



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This invention relates to a cable duct for cables and cords and outlet boxes to be connected thereto, the cable duct comprising a case-like channel track forming at least one cable space for cables and cords and having a front plate provided for outlet boxes with an installation slot facing the cable space; and a cover plate covering the installation slot.

It is known from the prior art to use a cable duct system in apartments, offices, staircases and the like, the required cables and conductors for electricity, telephone, antenna, etc., being encased in a cable duct extending along a desired wall/desired walls. Only socket outlets and other outlets and connections mounted in the front plate of the cable duct for use at various points are outwardly visible. All cords, outlet boxes and installation equipment are invisible within the case-like channel track. The outlet boxes are attached to the channel track in such a way that their cover plates are positioned substantially flush with the cover of the installation slot. The outlet boxes may be installed side by side in contact with or spaced apart from each other. Openings possibly remaining between the boxes are covered with cover plates of suitable size.

Today all cables and conductors in a cable duct are positioned loosely in the cable space of the channel track either on the bottom of the cable space, in its different compartments or on separate shelves. For connecting socket outlets, junction boxes and other required outlet boxes, the respective electrically insulated cable or conductor has to be drawn out from the cable space and connected electrically to the socket outlet box, etc., at a desired point of the cable duct. This makes the installation and connection of outlet boxes difficult and time-consuming, and a great number of different tools are frequently needed.

It has been suggested previously to replace a round power cable with a band-like cable and to provide the outlet boxes with special connectors which cut through or penetrate into the insulation of each conductor to be connected in such a way that the conductor need not be separately revealed at the connection point. This does make the connection of outlet boxes somewhat easier; however, an electrician is still needed for the installation and connection of the boxes.

The object of the present invention is to provide a cable duct which avoids the above-mentioned drawbacks and in which the conductors of a power cable can be kept bare over the whole length of the channel track so that they are ready to be connected to outlet boxes at any point of the channel track. This object is achieved by means of a cable duct of the invention which is characterized in that a conductor rail including fixed longitudinal bare current conductors is provided in the cable space of the channel track for electrical connection of the outlet boxes.

The invention is based on the idea that the con-

ductors of the power cable are arranged to run in the cable space of the channel track similarly as in a conductor rail known *per se*, whereby it is possible to use bare conductors ready to be connected at any point of the channel track. Thus, the connection of outlet boxes does not require any connection measures with respect to the conductors of the cable. A conductor rail of this type is disclosed e.g. in Finnish Patent Specification 44019.

For a cable duct of this type, socket outlets, junction boxes and other similar boxes to be connected to the power cable conductors are preferably made similar to known current supply devices developed for conductor rails, with the modification that the current supply devices now take into account the size of the installation slot of the cable duct and the position of the current conductors in the channel track with respect to the installation slot. This kind of current supply devices are disclosed e.g. in Finnish Patent Specifications 44019 and 47236 (push/pull contacts), GB Patent Specification 1 329 663 (turnable contacts) and GB Patent Specification 1 000 925 (pivotable contacts).

In the cable duct of the invention, outlet boxes can be connected to the current conductors without any installation or connecting measures which would require an electrician. The user may himself carry out the connection and fastening to the channel track of the cable duct by a simple movement of the hand.

The invention will be described in greater detail in the following with reference to the attached drawings, in which

Figure 1 is a perspective view of a cable duct arrangement in which a cable duct and outlet boxes according to the invention are used;

Figure 2 is an enlarged cross-sectional view of the channel track of the cable duct;

Figure 3 is a perspective view of one preferred embodiment of a current supply device to be used in the cable duct of the invention; and

Figure 4 is a perspective view of the different steps for connecting the current supply device of Figure 3 to the cable duct of the invention.

The cable duct system shown in Figure 1 of the drawings mainly comprises a cable duct 1 and a number of outlet boxes 2 provided with electrical equipment and cover plates. The cable duct comprises a metallic, case-like channel track 3 having a rectangular cross-section. The channel track comprises an internal cable space 4 and an installation slot 6 in a front plate 5, the installation slot being covered with an openable cover plate 7. Both longitudinal edges of the installation slot are formed into fastening edges 8 for outlet boxes.

The cable space 4 of the channel track forms an upper space 4A, a lower space 4B and an outlet box space 4C positioned therebetween. According to the invention, a conductor rail 9 is provided in the upper

space of the cable space of the channel track; in this specific case, the conductor rail replaces a conventional cable for the cable duct. The conductor rail comprises an insulation strip 10 and a number of current conductors 11 embedded in it. The current conductors are grouped so as to be positioned on the inner surfaces of the front and back plates of the channel track.

Other cables and cords 12 in the cable duct are positioned in the lower space of the channel track and connected to the connectors of the corresponding outlet boxes 2', such as telephone and antenna outlets.

Figure 3 of the drawings shows an outlet box 2 suitable for the conductor rail of the cable duct. In this specific case, the outlet box is a current supply device forming a base for a socket outlet. The current supply device comprises a case-like frame 13 and a contact pin 14 projecting from one narrow side of the frame. From the contact pin, two contact fingers 15 project in opposite directions, one of which is preferably axially adjustable in the contact pin. The frame is provided on both sides with pairs of openings 16 for contact plugs, and electrical connections for the contact fingers are provided within the frame.

The frame and the contact pin of the current supply device are dimensioned and shaped according to the height of the installation slot of the channel track and the position and dimensions of the conductor rail in such a way that the current supply device can be connected electrically to the conductor rail and fastened to the channel track as shown in Figure 4.

The current supply device is first inserted in a horizontal position in the installation slot of the channel track with the pin end ahead so as to be pressed against the back wall of the cable space, step A in Figure 4. Thereafter the frame is turned through 90° into a vertical position in such a manner that the frame is still positioned perpendicularly to the channel track and the contact pin points upwards. The contact pin thereby extends into the conductor rail between the two current conductor groups. A retaining shoulder 17 on the bottom of the frame is positioned behind the lower edge of the installation slot and keeps the frame in position in the installation slot, step B. The frame is then turned through 90° in a sideward direction, so that the whole frame is displaced within the channel track and the front surface of the frame is positioned substantially flush with the front plate of the channel track. In this position the contact fingers are turned towards the current conductors into contact with the corresponding conductors. A latch 18 at the other end of the frame is now displaced into a locking position, in which it is positioned behind the upper edge of the installation slot, step C. Finally, a cover plate 19 is fastened to the frame, step D. Grounding bows in the cover plate are provided with a prod which makes contact with a grounding strip 20 in the frame, and the grounding strip 20 in turn makes contact with a grounding strip 21 in the back wall of the channel

track.

The drawings and the description related to them are only intended to illustrate the idea of the invention. In its details, the cable duct of the invention may vary within the scope of the claims. In the embodiment shown in the drawings, the conductor rail is of the type disclosed in Finnish Patent Specifications 44019 and 47236. If required, the current conductors may be grouped in some other way. Even though it seems to be advantageous to position the conductor rail in the upper portion of the cable space, whereby there is no danger of cables and cords or other foreign objects falling on the conductor rail, the conductor rail may, however, be positioned in some other portion of the cable space, if required. As mentioned in the beginning of the description, the cable duct may deviate in type and structure from that shown in the figures, whereby the structure, shape and dimensions of the current supply device change correspondingly. In place of the disclosed socket outlet structure, the frame of the current supply device may be formed e.g. as a connector for connecting an extension cable.

The features disclosed in the foregoing description, in the following claims and/or in the accompanying drawings may, both separately and in any combination thereof, be material for realising the invention in diverse forms thereof.

### Claims

1. Cable duct for cables and cords and outlet boxes to be connected thereto, the cable duct (1) comprising
  - a case-like channel track (3) forming at least one cable space (4) for cables and cords (12) and having a front plate (5) provided for outlet boxes (2, 2') with an installation gap (6) facing the cable space; and
  - a cover plate (7) covering the installation slot;
 characterized in that a conductor rail (9) including fixed longitudinal bare current conductors (11) is provided in the cable space (4) of the channel track (3) for electrical connection of the outlet boxes (2).
2. Cable duct according to claim 1, in which the channel track (3) forms an upper cable space (4A) and a lower cable space (4B) separated by an outlet box space (4C), characterized in that the conductor rail (9) is provided in the upper cable space (4A) of the channel track.
3. Cable duct according to claim 1 or 2, characterized in that the current conductors (11) of the conductor rail (9) extend in the cable space (4) along the inner surfaces of the front plate (5) and

the back plate respectively of the channel track (3).

4. Cable duct according to any of claims 1 to 3, **characterized** in that a longitudinal, continuous grounding strip (20) is provided in the cable space (4) of the channel track (3). 5
5. Cable duct according to any of the preceding claims, **characterized** in that the outlet box (2) is 10  
a current supply device known per se having contact fingers (15) for the current conductors (11) of the conductor rail (9). 15

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FIG. 1

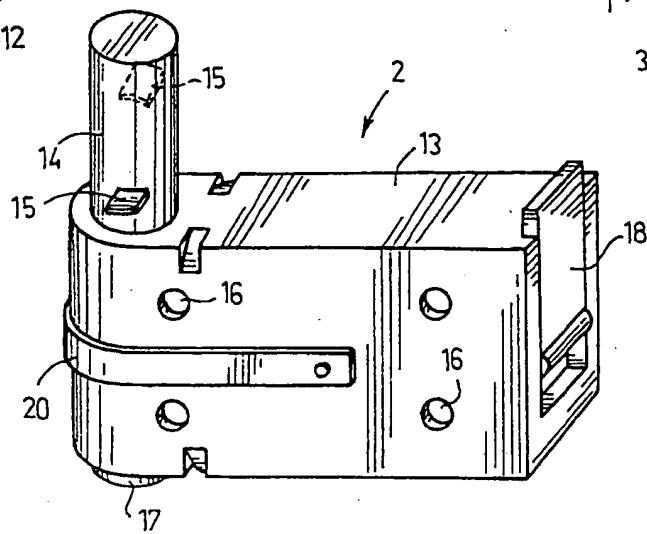
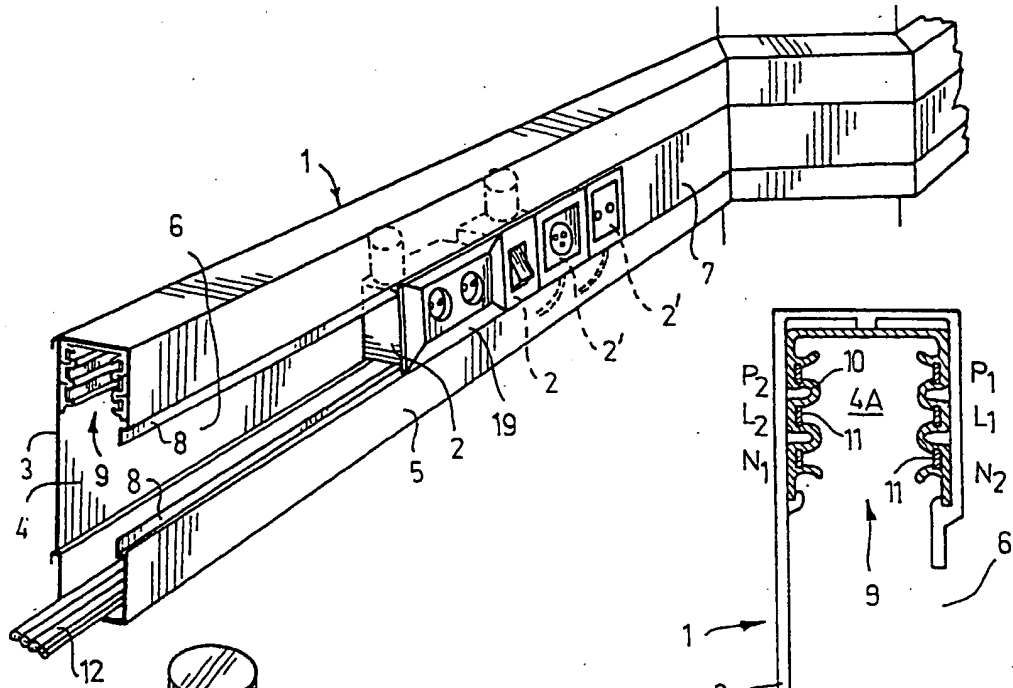


FIG. 3

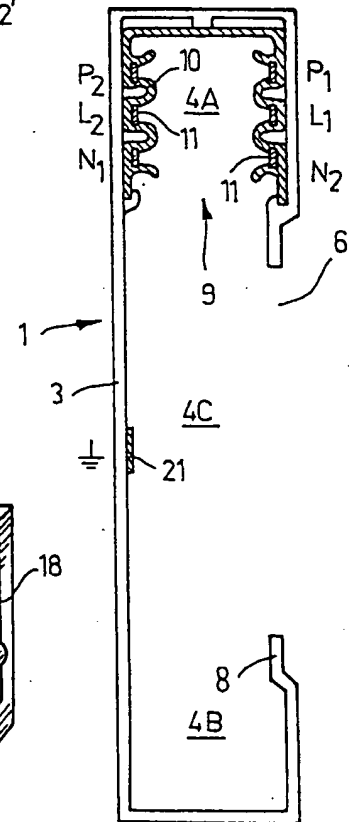


FIG. 2

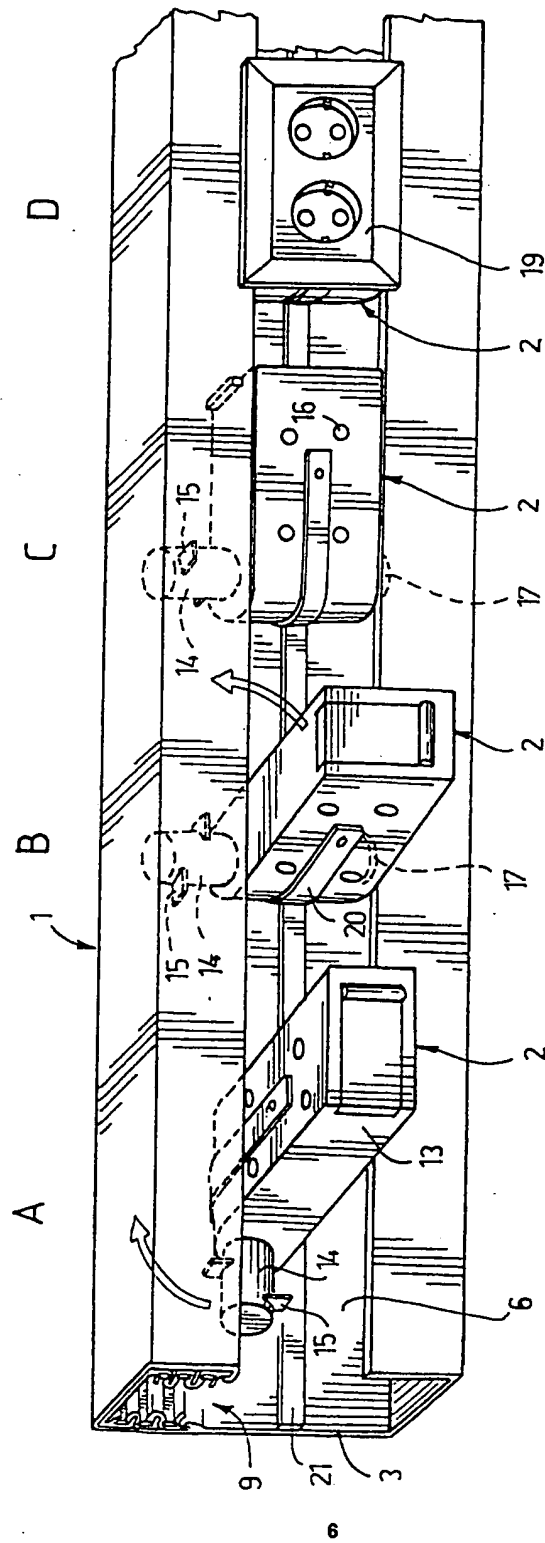


FIG. 4

European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number

EP 91 30 5752

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	WO-A-8701524 (BARRIER SHELF CO.) * figures 6-7 *	1-5	H02G5/04
A	DE-A-3628672 (UME DORN GMBH ET AL.) * the whole document *	1-3	
A	US-A-4688869 (KELLY) * figure 1 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			H02G H01R
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25 SEPTEMBER 1991	Examiner SIBILLA S.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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